**Customer Churn Analysis – Documentation**

**1. Objective**

The purpose of this analysis is to understand customer churn patterns, identify factors influencing churn, and provide actionable insights to improve retention.

**2. Data Source**

* Source: Imported via SQL GUI *Import Table Wizard*
* File: customer\_churn.csv

**3. Tools & Technologies**

* **Database:** MySQL (data storage & queries)

4. **Methodology**

**Step 1 – Data Import**

* Used the SQL GUI *Import Table Wizard* to load the dataset into the database.
* Verified successful import using:

SELECT COUNT(\*) FROM customer\_churn;

SELECT \* FROM customer\_churn;

**Step 2 – Data Understanding**

* Checked the Datatypes

Describe hen.`telco-customer-churn`;

**Step 3 – Data Cleaning**

* Checked for missing values

SELECT \* FROM hen.`telco-customer-churn`

where customerID is null or gender is null or SeniorCitizen is null

or Partner is null or Dependents is null or tenure is null

or PhoneService is null or MultipleLines is null or InternetService is null

or OnlineSecurity is null or OnlineBackup is null or PaperlessBilling is null

or DeviceProtection is null or TechSupport is null

or StreamingTV is null or StreamingMovies is null or Contract is null

or MonthlyCharges is null

or TotalCharges is null or Churn is null;

**Conclusion:**  
 No NULL or blank values were found in the dataset.

**Step 4 – Checking for Duplicates**

* Verified whether duplicate records exist based on the unique customer identifier

Select customerID, gender, SeniorCitizen, Partner, Dependents, tenure, PhoneService, MultipleLines,

InternetService, OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport,

StreamingTV, StreamingMovies, Contract, PaperlessBilling, PaymentMethod,

MonthlyCharges, TotalCharges, Churn , count(\*) as Total\_count

FROM hen.`telco-customer-churn`

group by customerID, gender, SeniorCitizen, Partner, Dependents, tenure, PhoneService, MultipleLines,

InternetService, OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport,

StreamingTV, StreamingMovies, Contract, PaperlessBilling, PaymentMethod,

MonthlyCharges, TotalCharges, Churn

having Total\_count > 1;

**Conclusion:**  
 No duplicates were found in the dataset.

**Step 4 – Exploratory Data Analysis (EDA)**

**-- Churn Counts by Contract Type**

Select Contract, Churn, count(\*) as Total\_Count

from hen.`telco-customer-churn`

group by Contract, Churn

order by Contract;

**-- Total Sales by Contract Type and Churn**

Select Contract, Churn, round(sum(TotalCharges),2) as Total\_Sales

from hen.`telco-customer-churn`

group by Contract, Churn

order by Contract;

**-- Average Sales by Contract Type and Churn**

Select Contract, Churn, round(avg(TotalCharges),2) as Avg\_Sales

from hen.`telco-customer-churn`

group by Contract, Churn

order by Contract;

**Observation:** Customers with **Month-to-Month contracts** are **more likely to churn** compared to those on **One-Year** or **Two-Year** contracts.

**-- Finding factors for churn analysis**

**-- Churn Analysis by gender**

Select gender, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by gender, Churn;

**-- Churn Analysis by SeniorCitizen**

Select SeniorCitizen, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by SeniorCitizen, Churn;

**-- Churn Analysis by PhoneService**

Select PhoneService, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by PhoneService, Churn;

**-- Churn Analysis by MultipleLines**

Select MultipleLines, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by MultipleLines, Churn;

**-- Churn Analysis by InternetService**

Select InternetService, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by InternetService, Churn;

**-- Churn Analysis by OnlineSecurity**

Select OnlineSecurity, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by OnlineSecurity, Churn;

**-- Churn Analysis by OnlineBackup**

Select OnlineBackup, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by OnlineBackup, Churn;

**-- Churn Analysis by DeviceProtection**

Select DeviceProtection, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by DeviceProtection, Churn;

**-- Churn Analysis by TechSupport**

Select TechSupport, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by TechSupport, Churn;

**-- Churn Analysis by StreamingTV**

Select StreamingTV, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by StreamingTV, Churn;

**-- Churn Analysis by StreamingMovies**

Select StreamingMovies, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by StreamingMovies, Churn;

**-- Churn Analysis by PaperlessBilling**

Select PaperlessBilling, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by PaperlessBilling, Churn;

**-- -- Churn Analysis by PaymentMethod**

Select PaymentMethod, Churn, count(\*) as total\_count

from hen.`telco-customer-churn`

group by PaymentMethod, Churn

order by PaymentMethod; -- who are opting for 'Electronic check' payment method are more likely to churn

**Observation:**

1. **By Gender**
   * No significant difference in churn between Male and Female customers.
2. **By Senior Citizen Status**
   * Senior Citizens (41.7% churn rate) are more likely to churn than Non-Senior Citizens (23.6%).
3. **By Phone Service**
   * Customers with Phone Service show slightly higher churn rates than those without.
4. **By Multiple Lines**
   * Having multiple lines does not significantly affect churn.
5. **By Internet Service**
   * Customers with Fiber Optic service are more likely to churn compared to DSL or no internet.
6. **By Online Security**
   * Customers **without** Online Security are more likely to churn.
7. **By Online Backup**
   * Customers **without** Online Backup are more likely to churn.
8. **By Device Protection**
   * Customers **without** Device Protection are more likely to churn.
9. **By Tech Support**
   * Customers **without** Tech Support are more likely to churn.
10. **By Streaming TV**
    * Streaming TV subscription does not significantly influence churn.
11. **By Streaming Movies**
    * Streaming Movies subscription does not significantly influence churn.
12. **By Paperless Billing**
    * Customers with Paperless Billing are more likely to churn.
13. **By Payment Method**
    * Customers paying via **Electronic Check** have higher churn rates compared to other payment methods.

-- who is giving more revenue to the company on the basis of churn

-- a. Total\_sales

Select churn, round(sum(TotalCharges),2) as Total\_Revenue

from hen.`telco-customer-churn`

group by churn

order by Total\_Revenue desc;

-- b. Avg\_sales

Select churn, round(avg(TotalCharges),2) as Avg\_sales

from hen.`telco-customer-churn`

group by churn

order by Avg\_sales desc;

-- who is giving more revenue to the company on the basis of gender

-- a. Total\_sales

Select gender, round(sum(TotalCharges),2) as Total\_Revenue

from hen.`telco-customer-churn`

group by gender

order by Total\_Revenue desc;

-- b. Avg\_sales

Select gender, round(avg(TotalCharges),2) as Avg\_Sales

from hen.`telco-customer-churn`

group by gender

order by Avg\_Sales desc;

-- From which payment method is giving higher revenue

-- a. Total\_Sales

Select PaymentMethod, round(sum(TotalCharges),2) as Total\_sales

from hen.`telco-customer-churn`

group by PaymentMethod

order by Total\_sales desc;

-- a. AVg\_Sales

Select PaymentMethod, round(avg(TotalCharges),2) as AVg\_sales

from hen.`telco-customer-churn`

group by PaymentMethod

order by AVg\_sales desc

-- Sales on contract Basis

-- a.Total\_Sales

Select Contract, round(sum(TotalCharges),2) as Total\_sales

from hen.`telco-customer-churn`

group by Contract

order by Total\_sales desc;

-- a. AVg\_Sales

Select Contract, round(avg(TotalCharges),2) as AVg\_sales

from hen.`telco-customer-churn`

group by Contract

order by AVg\_sales desc;

**Step 6 – Revenue Analysis**

**A. Revenue by Churn Status**

* **Total Revenue**
  + Non-churned customers generate significantly higher total revenue compared to churned customers.
* **Average Revenue per Customer**
  + Non-churned customers also have a slightly higher average revenue compared to churned customers.

**B. Revenue by Gender**

* **Total Revenue**
  + Male customers contribute slightly more revenue than female customers, but the difference is not much.
* **Average Revenue per Customer**
  + Average revenue is almost identical between male and female customers.

**C. Revenue by Payment Method**

* **Total Revenue**
  + Customers paying via **Electronic Check** contribute the highest total revenue
* **Average Revenue per Customer**
  + **Bank Transfer (automatic)** customers have the highest average revenue per customer.

**D. Revenue by Contract Type**

* **Total Revenue**
  + **Two-year contracts** contribute the highest total revenue among all contract types.
* **Average Revenue per Customer**
  + Customers on **Two-year contracts** also have the highest average revenue per customer.